What is claimed is:

1. An optical waveguide, comprising:

a silica substrate;

a buffer layer provided on the silica substrate;

at least one core provided on the buffer layer; and

an upper cladding layer provided on the buffer layer and covering the core,

in which a thermal expansion coefficient of the buffer layer and a thermal expansion coefficient of the upper cladding layer are substantially equal.

2. The optical waveguide as claimed in claim 1, wherein a refractive index of the buffer layer is higher than a refractive index of the silica substrate.

3. The optical waveguide as claimed in claim 1, wherein a softening temperature of the upper cladding layer is lower than a softening temperature of the buffer layer.

4. The optical waveguide as claimed in claim 2, wherein a softening temperature of the upper cladding layer is lower than a softening temperature of the buffer layer.

5. The optical waveguide as claimed in claim 3, wherein at least boron (B) and phosphorus (P) are added to the upper cladding layer.

6. The optical waveguide as claimed in claim 4, wherein at least boron (B) and phosphorus (P) are added to the upper

cladding layer.

7. The optical waveguide as claimed in claim 5, wherein at least germanium (Ge) is added to the buffer layer.

8. The optical waveguide as claimed in claim 6, wherein at least germanium (Ge) is added to the buffer layer.

9. The optical waveguide as claimed in claim 1, wherein the buffer layer have a thickness of not less than 1 μm and not more than 5 μm.

10. The optical waveguide as claimed in claim 1, further comprising another buffer layer interposed between the silica substrate and the above buffer layer, a thermal expansion coefficient of the another buffer layer is between a thermal expansion coefficients of the silica substrate and the above buffer layer.

11. A method of fabricating an optical waveguide, comprising the steps of:

forming a buffer layer on a silica substrate by using a vapor phase deposition;

forming a core layer on the buffer layer by using a vapor phase deposition;

forming first and second cores by patterning the core layer;

forming an upper cladding layer covering the first and second cores by using a vapor phase deposition, said upper cladding layer having a thermal expansion coefficient that

is substantially equal to that of the buffer layer; and

annealing the upper cladding layer to fluidize.

12. The method of fabricating an optical waveguide as claimed in claim 11, wherein the upper cladding layer are deposited and annealed with multiple steps.